

REMARKS

Applicants, their principal representatives in Germany, and the undersigned have carefully reviewed the first Office Action of December 30, 2005 in the subject U.S. patent application, together with the prior art cited and relied on by the Examiner in the rejections of the claims. In response, the Substitute Specification of the application and the claims have been amended. It is believed that the claims now pending in the subject application are patentable over the prior art cited and relied on. Reexamination and reconsideration of the application, and allowance of the claims is respectfully requested.

The subject application discloses, and claims, a method and an apparatus that is usable to control web tension in a web processing machine, such as a web-fed rotary printing press. As is well known in the printing industry, it is very important to be able to maintain a constant web tension or a known web tension in the web, as that web passes through a number of web processing units. These processing units include the roll changer 02, the web draw-in unit 03, the several printing units 04, 06, the traction roller 07, the longitudinal cutting device 08, the turning bars 09, the registration device 11, the processing unit 12, the formers 13 and the folding unit 14, all as seen in Fig. 1. Each one of these processing units can have an effect on the tension of the web, as it is processed. In steady state operation of the processing unit, the web tension is maintained at an actual reference variable. This is typically a range of web tensions in which the tension is maintained, typically by control of a traction roller 07 and a web - draw-in unit 03 in response to signals provided by a regulating unit 22.

One occurrence that has a substantial effect on the web tension, for a defined period of time, is a web splice. As is well known in the art, the material which is supplied to the processing machine, is typically in the form of a roll. As one roll is being depleted,

a web from a new roll is spliced to it. The splicing of the webs together generates a splice or a glue area, schematically depicted at 26 in Fig. 1. As this splice travels through the processing machine, it raises the web tension. Such a tension increase is predictable and can be anticipated. As the webs are about to be spliced, there are a number of indicators or signals which can be used to indicate the imminent occurrence of the web tension increasing event. A computing unit 23 can be provided with various input data, represented at "g" in Fig. 1, and can also be supplied with information from the roll changer. All of this information is processed, and is fed to the regulating unit 22, as depicted schematically in Fig. 1.

Once the regulating unit 22 is in receipt of this information, which is typically in the form of a time based function, it can regulate the traction roller 07, the web draw-in unit 03 or other processing units of the processing machine. The actual reference variable of the web tension is reduced by an amount which will compensate for the increased value in the web tension which is a result of the web tension affecting interference. The result is that the overall web tension will remain in the range provided by the actual reference variable that exists during steady state operation of the processing machine. The reduction of the tension is accomplished just before, or concurrently with the tension increase that is caused by the interference. The use of the computing unit to receive and to store data regarding web properties and the time at which the interference has or will occur, allows the regulating unit to vary the web tension prospectively instead of retrospectively. The net result is a substantial reduction in wasted web. Since the tension does not fluctuate drastically, the registration of the various color printed on the web by the several printing group 16, 17, 18 and 19 in the printing units 07 and 06 will remain in the acceptable range. As a result, much less of the printed web will have to be discarded.

In the first Office Action of December 30, 2005, the drawings were objected to as failing to show every feature of the invention specified in the claims. The drawings were also objected to as failing to show the reference symbols S0-ist and S1-ist, as set forth at page 17, line 13 of the Substitute Specification.

In response, the Substitute Specification has been amended, at paragraph 41 to remove the suffixes "ist" from the tension values S0 and S1. Since the actual value S0-ist and S1-ist are recited as being actual values of tensions, which actual values are thus identified generally as S0 and S1, the deletion of the two "ist" suffixes does not alter the scope or understanding of the invention.

The assertion in the first Office Action that the drawings fail to show the means for sensing a web tension affecting interference is respectfully traversed. As was discussed, above, the web tension affecting interference, which typically must be counteracted, is one that is caused by a web splice. Such a web splice is accomplished at the roll change 02 in a manner which is well known to one of skill in the art and which does not need to be discussed in detail. As may be seen in Fig. 1, the roll changer 02 is in communication with the computing unit 23 which is, in turn, in communication with the regulating unit that controls the web tension. The Substitute Specification, particularly at paragraphs 035, 038, 043, 044 and 045 discusses the use of the roll changer to provide information which will indicate the imminent or actual occurrence of a web tension affecting interference. For example, the decrease in diameter of the old or depleting roll can be sensed by the roll changer. The gluing of the new web to the old web, and the subsequent cutting of the old web can also be sensed by the roll changer. These events are discussed at paragraph 038. The computing unit can also be provided with information about the web which is being depleted or spliced at the roll changer 02. Such information, which is indicated schematically at "g" in Fig. 1, can

include the web type, the width of the web as well as other characteristics that affect the behavior of the web.

Paragraph 045 discusses other events which can trigger the reduction of the web tension. These can include a detection of a steep rise in the web tension, as sensed by the web tension measuring roller 21 or another similar roller, the passage of the glue spot 26 past a suitable detector, or the like. These various means for sensing a web tension affecting interference are depicted, at least in schematic fashion, in Fig. 1 of the drawings. It is thus respectfully believed that the drawings filed with the application show every feature of the claimed invention. The objection to the drawings under 37 CFR 1.83(a) is thus respectfully traversed.

The specification of the application, as set forth in the Substitute Specification filed with the Preliminary Amendment were objected to as having several informalities. At line 1 of page 21 it was asserted that the "m" should be "Atm." The Substitute Specification has been amended to reflect that change. The Substitute Specification has also been amended at several other locations to correct minor typographical errors. The various changes made to the Substitute Specification are believed not to add any new matter.

Claim 33 was objected to as containing an incorrect spelling of the term "affecting." That error has been corrected.

Claims 94-99 and 112-123 were rejected under 35 USC 112 first and second paragraphs. Those claims have been cancelled. It is believed that the cancellation of these claims overcomes these rejections under 35 USC 112 first and second paragraphs.

Claims 33-84, 88-90, 94-96, 100-102, 106-108, 112-114, 118-120, 124 and 125 were rejected under 35 USC 102 as being anticipated by newly cited U.S. patent No.

3,510,036 to Lewis et al. Claims 85-87, 91-93, 97-99, 103-105, 109-111, 115-117 and 121-123 were rejected under 35 USC 103(a) as being unpatentable over Lewis et al.

In response, each of independent claims 33, 34, 36 and 124 have been amended. It is believed that these claims, and the various remaining claims, which are dependent from one or the other of the independent claims, are not anticipated by, nor rendered obvious to one of skill in the art over the Lewis et al. reference for the following reasons.

The Lewis patent is directed to an inserter and a splicer. The relevant portions of Lewis are those portions which are directed to the splicer aspect of the invention. The slight changes in web tension discussed in Lewis, in connection with maintenance of registration, are not relevant to the subject invention. In Lewis there is provided a slave drive motor 62 which drives a draw roller 18. The slave motor 62 is controlled by a master unit 58. That master unit 58 can be adjusted through a planetary gear 54 by the operation of a correction motor 70.

A master control panel 80 is asserted, at Column 3, line 52 as having "computer circuitry." However, given the filing date of this reference 1968, and the depiction in Fig. 2, it is apparent that this "computer circuitry" is not the equivalent to the type of hardware that is currently understood to be meant by the use of a term such as computer.

In the Lewis device, it is recited that the web tension is maintained between limits which are set and which do not vary. The upper limit prevents breakage of the web whereas the lower limit prevents wandering of the web. Where a flying web splice is to be accomplished, the press operator manually presses a button that starts the splicing process. This button pressing step also causes the tension of the web to be reduced to its lower limit. As indicated above, that lower limit is one that is set and that does not

vary.

A piece of reflective tape is adhered to the spliced web and is used to signal the passage of the splice past a sensor. At that time, the tension of the web can be restored to its original, upper value.

While the Lewis reference is directed to solving the same general problem to which the subject application is directed, there are substantial differences in the two solutions. In the present method and device, as recited in claims 33, 35 and 124 there is provided a computing unit which is provided with various informational characteristics of the web being processed. As discussed in the specification, these characteristics may include web weight, web dimensions, historical information relating to the behavior of the web in response to its being subjected to ink and dampening fluid and the like. All of these pieces of information are used in the computing unit to arrive at a function which will be provided to the regulating unit in order to reduce the tension in the web in anticipation of the imminently occurring web tension affecting interference. The web tension is thus maintained at its usual level during web splicing. The web tension is not merely automatically reduced to a single lower level, which is not web characteristic related or dependent. Thus the method and apparatus of the subject invention, as set forth in currently amended claims 33, 35 and 124 is not anticipated by, nor rendered obvious over the Lewis reference.

In the Lewis disclosures, a piece of reflective tape is secured to the web, in the area of the splice and that piece of reflective tape is used to signal the passage of the splice past a certain sensor in the device. Claim 34 of the subject application has been amended to recite that there are a plurality of printing groups in the processing machine, which include a first printing group and a last printing group. Claim 34 further recites that a tension measurement taken after the last printing group is used to control

the tension in the web prior to the first printing group, all in the direction of travel of the web. This means that the tension is controlled in response to a second tension, not in response to the passage of a certain part of the web through a specific location in the machine. It is thus believed that currently amended claim 34 is also patentable over the prior art Lewis reference.

All of the remaining claims in the subject application depend from one or the other of believed allowable independent claims 33, 34, 35 and 125. These claims are thus also believed to be allowable. The Lewis reference uses simple electrical circuitry to change the speed of driving of the draw roll 78 to change web tension between two pre-set upper and lower values. If the machine control 80 is the regulating unit, it cannot also be the computing unit. The sensing of the web tension affecting interference in Lewis is only the press operator's pushing of a button to actuate a splice process. Lewis fails to provide any change in the tension based on any variables. In Lewis, the tension is either at an upper level or at a lower level. The Lewis device maintains the tension at the lower level until a piece of reflective tape passes a sensor. The features added to independent claims 33, 34, 35 and 124 of the present application, by the currently pending dependent claims, taken in combination with the claims from which they depend, are not anticipated by, or rendered obvious over the Lewis reference. These claims are thus also believed to be allowable.

SUMMARY

Several paragraphs of the Substitute Specification have been amended either to correct an informality noted by the Examiner, or to correct minor typographical errors noted by the undersigned. It is believed that these minor changes do not constitute any new matter. Independent claims 33, 34, 35 and 124, as well as various ones of the dependent claims, have been amended. It is believed that all of the claims now pending in the subject U.S. patent application are patentable over the Lewis reference which was cited and relied on in their rejections. Allowance of the claims, and passage of the application to issue is respectfully requested.

Respectfully submitted,

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